According to the Examiner regarding claim 1:

> Meyer et al. teaches a method for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communication network (abstract, figs. 1-8), said method comprising the steps of:
>
> determining a number of pooled available channel processor (CP) resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS (col. 4, lines 5-43, col. 9, 10-40);
>
> in response to notification of a call originating from or to a subscriber in any of said plurality of cells, determining if said number of available CP resources for processing of said call; and assigning said call to said available CP resource which has been selected (col. 5, lines 1-35, col. 9, line 40-col. 10, line 20).

Applicant respectfully disagrees with the above assertions based on the teachings of Meyer. However, before reviewing Meyer, Applicant will first review the claimed invention as recited in claim 1. Claim 1 recites a method for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network. The method includes the steps of determining a number of available pooled channel processor (CP) resources which are unused in the BBS. The BBS supports a plurality of cells. Each CP is for processing any of a plurality of traffic channels contained on any frequency channel assigned to the BBS.

In response to notification of a call originating from or to a subscriber in any of the plurality of cells supported by the BBS, it is determined if the number of available CP resources of the BBS is at least one. Significantly, any of the available CP resources can be used to process calls involving subscribers in any of the plurality of cells supported by the BBS. The available CP resource selected is then assigned to process the call. Thus, each CP may process any channel on any RF carrier allocated for any

cell independent of any other CPs that may be processing channels on the same or a different RF carrier.

Conventional DSP units in conventional sectorized systems are pre-configured to operate on only the particular RF channels which have been assigned to a specific sector of the BTS. Thus, DSP units are not generally fungible as between the plurality cells supported by a particular BTS, such as a plurality of sectors. For example, these DSP units cannot be allocated from one sector to another. In cell sites that experience heavy traffic, this limitation can result in a poor allocation of system resources.

In particular, one of the problems with using sectorization in wireless broadband base stations (BBS) concerns trunking efficiency. Normally, a fixed number of RF carriers is assigned to a sector with the BTS concentrating traffic through a common interface to the PSTN. In many instances, traffic needs in one sector can occasionally exceed the sector's RF and DSP resources while resources may be available in another sector. However, because the number of RF channels allocated to a sector is fixed in conventional BBS systems, those resources can be blocked and left unused, lowering the trunking efficiency of the BBS. Applicant's claimed invention importantly substantially solves the blocking problem experienced by a BBS by making available any of the DSP resources to process any traffic channel contained on any of the plurality of RF carriers supported by the BBS, irrespective of the allocation of RF carriers to particular cells supported by the BBS.

Meyer is appropriately entitled "Adaptive antenna pattern control for a multiple access communication system" as it relates to antenna beam pattern control based sector dimension modification. According to its Abstract, Meyer discloses dynamic antenna pattern modification using multi-element, multi-column antennas having the radiation pattern controlled dynamically based on the number of users serviced by the sectors of a multi-sector base station. The number of users is determined either directly through information available from the base station, or indirectly by monitoring the

system load (number of users). *Sectors of the cell servicing fewer users are expanded to accommodate users from portions of an adjacent sector, in the same cell, by modification of the antenna coverage patterns in each sector.* The antenna pattern for a sector serving a relatively large number of users, for a given cell radius, would contract in azimuth for both transmit and receive functions and decrease both transmitted output power and received signal sensitivity. Simultaneously, antenna coverage patterns in the adjacent sector (in the same cell) would expand in azimuth to provide the same cell radius, coverage and performance level as prior to the pattern modification. (italics for emphasis only).

Thus, Meyer attempts to overcome a significant issue with CDMA systems, specifically, the so-called "cell breathing issue". CDMA systems become susceptible to interference, particularly as they become loaded. To a given user, all other CDMA users on the same RF carrier in the same cell are interferers. Users in other adjacent cells on the same RF carrier are also interferers. As the number of users on that carrier increases, the interference increases.

CDMA systems compensate for this interference via power control, reducing power in an attempt to reduce interference. This reduction in power results in reduction of coverage. Thus a CDMA cell breathes, as its cells can have their capacities periodically increase and decrease. The problem with decreasing power is the user may not be able to handover into another cell as he/she moves from one cell to another because of the decreased coverage.

Meyer uses a smart (adaptive) antenna array to address this problem. Meyer controls the beam pattern coverage of the adaptive array to limit the number of users within a given cell. By narrowing the beam, the number of users that are covered in the cell is limited. This adjustment is made by measuring interference. The more interference measured, the narrower the beamwidth. It assumes that adjacent cells in

the same (Figure 2) or different (Figure 1c) base stations can adjust their beam patterns to fill in the coverage that the capacity loaded cell vacates.

The only connection Applicant can find between Meyer and the claimed invention is that both very broadly speaking relate to sector capacity issues in a sectorized base station. However, Meyer and the claimed invention utilize far different methods and apparatus as explained below.

Meyer uses adaptive antenna pattern adjustments to affectuate cell size and corresponding number of cellular uses while the claimed method/apparatus dynamically allocates signal processing resources (e.g. DSP) to any sector served by the base station. Meyer does not disclose or suggest reallocating processing resources, i.e. DSP resources from one sector to another. In Meyer, each sector has its own dedicated "blocked" resources and Meyer attempts to fully utilize theses dedicated resources by adjusting beam patterns. In contrast, the claimed invention is independent of the "cell breathing" issue. It is independent of CDMA. It is independent of smart antennas. However, this is not to say the claimed invention cannot be used for CDMA systems or smart antenna systems.

As noted above, the Examiner asserts that "Meyer teaches a method for dynamically allocating signal processing resources in a wireless multichannel broadband base station for cellular communications network (abstract, figs 1-8) ..." Applicant respectfully disagrees. The Meyer Abstract describes dynamic antenna pattern modification controlling radiation patterns as determined by the number of users in the as determined by a "broadband noise" measurement. It does not disclose or suggest Applicant's claimed allocation of processing resources from one sector to another to handle an increase of capacity.

Figures 1 through 2 of Meyer show antenna coverage patterns, Figure 3 shows a sectored antenna configuration, Figures 4, 6, and 7 show smart antenna HW configurations, uplink, downlink, and downlink, respectively. Figure 5 shows a sensor

control box for controlling the antenna pattern and Figure 8 describes the algorithm for determining when to adjust the antenna pattern. Clearly, the Abstract and figures 1-8 do not disclose or suggest Applicant's claimed allocation of DSP processing resources for use in a given sector based on capacity.

Column 4, lines 5-43, col. 9, 10-40 do not disclose or suggest Applicant's claimed "determining a number of pooled available channel processor (CP) resources which are unused in said BS, said BBS support in a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS" as asserted by the Examiner above. Instead, col. 4, lines 5-43 of Meyer describe control of the geographic coverage of the Meyer system. It describes the software and hardware converting between capacity and coverage (range extension) by adjusting gain and coverage areas via metrics "inherent in CDMA system operation". Column 9, lines 10-40 describe the Meyer algorithm for adjusting the beam pattern. In contrast, the claimed invention describes algorithms for allocating processing resources.

Column 4, lines 44-65, col. 9, lines 40-65 of Meyer do not disclose or suggest Applicant's claimed "in response to notification of a call origination from or to a subscriber in any said plurality of cells, determined if said number of available CP resources of said BSS is at least one..." as asserted by the Examiner above. Instead, col. 4, lines 44-65 discloses using a metric of the number of users through a measurement of the system noise floor. In contrast, the invention uses the actual number of users assigned to processing resources. Meyer is designed to be used an appliqué (col. 4 line 40-42) and it must infer capacity indirectly by interference measurements. Thus, Meyer clearly does not disclose or suggest determining if CP resources are available. Thus, Meyer teaches away from the claimed invention since the claimed invention measures capacity directly by processor usage.

Column 9, lines 40-65 of Meyer does not disclose or suggest Applicant's determining step either. Col 9, lines 40-65 discloses the contraction/expansion of beam

width or increase/decrease in transmit gain and receive sensitivity. The "processing flow" mentioned with respect to figure 8 is controlling the beam pattern and/or transmit gain/receive sensitivity thus limiting the flow of users capable of accessing the base station. The invention does not managing processing resource allocation by adjusting beam pattern or transmit/receive power.

Column 5, lines 1-35, col. 9 line 40-col. 10 line 20 of Meyer does not disclose or suggest Applicant's claimed "selecting any of said available CP resources for processing of said call; and assigning said call to said available CP resource which has been selected. )." Col 5 lines 1-35 of Meyer discloses adjusting coverage patterns until "each section of the base station are all exposed to the maximum number of users a station can handle." However, there is no description of the base station architecture that would allow such maximization of all "sections" of the base station.

Typical sectorized base station processing resources are blocked to specific sectors. Meyer's invention would not change this basic limitation of narrowband (single carrier) architecture. What Meyer's discloses (col. 5 lines 18-35) is a method for more efficiently using resources confined to a given sector. If a sector's resources are blocked use to insufficient coverage of that sector, Meyer's invention can expand the coverage by adjusting the antenna pattern to cover more users. The claimed invention is not limited by coverage patterns. The broadband base station architected in the invention is such that the signals that are supported in a given sector can be mapped to any processing resource.

Col 9 line 40 to col. 10 line 20 does not disclose or suggest Applicant's claimed selecting step. Col 9 line 40 to col. 10 line 20 discloses a condition where "resources cannot be balanced" meaning the beam pattern cannot be further adjusted. The claimed invention does not have this limitation. Any signal can be mapped to any processing resource such that resources are never blocked due to coverage patterns of a given sector.

Since Meyer does not disclose or suggest any of Applicant's limitations recited in claim 1 as demonstrated above, Applicant submits that claim 1 and its respective dependent claims are clearly patentable claims.

According to the Examiner regarding claim 8 (system):

> Meyer et al teaches a resource management system for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communications network (abstract, figs. 1-8), comprising:
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> means for determining a number of available pooled channel processor resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS (col. 4, lines 5-43, col. 9, 10-40);
>
> means responsive to notification of a call originating from or to a subscriber in any of said plurality of cells for determining if said number of available CP resources is at least one (col. 4, lines 44-54, col. 9, lines 40-65);
>
> means for selecting any of said available CP resources for processing of said call; and means for assigning said call to said available CP resource which has been selected (col. 5, lines 1-35, col. 9, line 40-col. 10, line 20).

Applicant respectfully disagrees with the above assertions based on the teachings of Meyer. The Examiner asserts that "Meyer et al teaches a resource management system for dynamically allocating signal processing resources in a wireless multichannel broadband base station (BBS) for a cellular communication network (abstract, figs. 1-8), comprising: ..." However, there is no description in Meyer of a resource management system for allocating signal processing resources. The closest, but still far different, teaching in Meyer to Applicant's resource management system for allocating signal processing resources is figure 5 which shows a system for monitoring and measuring interference and adjusting antenna beam pattern as well as transmit gain/receive sensitivity based on noise measurements.

Applicant respectfully disagrees with the Examiner's assertion that Meyer discloses "...means for determining a number of available pooled channel processor resources which are unused in said BBS, said BBS supporting a plurality of cells, each said CP processing any of a plurality of traffic channels contained on any frequency channel assigned to said BBS (col. 4, lines 5-43, col. 9, 10-40);" There is no description in Meyer of the claimed "pooled" channel processor resources. Meyer simply provides a method of determine the number of users inferred by interference measurements which is independent of the actual number of resources that the base station may support. Further, Meyer does not indicate that the resources may be allocated across different frequencies.

Applicant respectfully disagrees with the Examiner's assertion that Meyer discloses "...means responsive to notification of a call originating from or to a subscriber in any of said plurality of cells for determining if said number of said number of available CP resources is at least one (col. 4 lines 44-65, col. 9 lines 40-65);" Meyer makes no mention of responding to an individual call to/from an individual subscriber. Meyer cannot be responsive in such a manner in such resolution of a single call since calls, i.e. users are inferred by interference measurements, not by processor resource usage.

Applicant respectfully disagrees with the Examiner's assertion that Meyer discloses "...means for selecting any of said available CP resources for processing of said call; and means for assigning said call to said available CP resource which has been selected (col. 5 lines 1-25, col. 9, line 40-col. 10 line 20)." Meyer makes no mention of selecting an individual CP resource. Meyer merely implies that CP resource may be more fully utilized by adjusting cell coverage such that more users have access to the resources. Since Meyer does not disclose or suggest <u>any</u> of Applicant's limitations recited in claim 8 as demonstrated above, Applicant submits that claim 8 and its respective dependent claims are clearly patentable claims.

Although independent claims 1 and 8 have been shown above to be patentable claims, several dependent claims provide independent bases for patentability that deserve a brief mention.

Applicant's claims 2-7 and 9-14 recite decrementing the number of available CP resources by one after said assigning step, rejecting said call if all CP resources of said BBS are in use and incrementing a count of rejected calls each time a call is rejected for lack of sufficient available CP resources. Applicant respectfully disagrees with the Examiner's assertion regarding claims 2-7 and 9-14 that "Meyer et al teaches decrementing the number of available CP resources by one after said assigning step, rejecting said call if all CP resources of said BBS are in use and incrementing a count of rejected calls each time a call is rejected for lack of sufficient available CP resources (col. 4, 3-65, col. 6 lines 10-56)" There is nothing in Meyer that discloses or suggests decrementing or incrementing CP resources. As noted above, Meyer discloses adjusting antenna beam patterns and transmit power/receive sensitivity in response to noise measurements. The "counter" disclosed in Meyer is a count of users inferred from the noise measurements. It is not a count of processing resources actually allocated to the cellular users as used in Applicant's invention and claimed. Again, Meyer must infer the users as an appliqué, because as an appliqué it does not have access to the actual number of users or processing resources in use. Accordingly, claims 2-7 and 9-14 each provide an independent basis for patentability.

Claims 15-17 also provide an independent basis for patentability. Applicant respectfully disagrees with the Examiner's assertion regarding claims 15-17 that "Meyer et al teaches wherein said BBS is a sectorized BBS, said sectored BBS supporting a plurality of sectors and BBS comprises a plurality of broadband transceivers (Figs 2, 8 col. 6, lines 55-65, col. 9, lines 11-40)". Applicant agrees that Meyer can be applied to a sectored base station such as recited in the claimed invention . However, Meyer does not indicate such a base station is a broadband base station, or that the transceivers

are broadband, i.e. multi-carrier (multiple carriers through one transceiver rather than one carrier per transceiver). Accordingly, Applicant submits that claims 15-17 provide an independent basis for patentability.

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance.

Respectfully submitted,

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